

EXHIBIT 4

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Motions, Pleadings and Filings

United States District Court, D. Massachusetts.
 POLAROID CORP.

v.

EASTMAN KODAK CO.
 No. 76-1634-MA.

Oct. 12, 1990.

I. INTRODUCTION

MAZZONE, District Judge.

*1 On April 26, 1976, Polaroid Corporation ("Polaroid") filed its complaint charging that Eastman Kodak Company ("Kodak") had infringed twelve Polaroid patents relating to integral instant cameras and film. Over the next five years, the parties engaged in extensive discovery on the issues of liability and infringement. Those issues were tried before Judge Rya Zobel between October 5, 1981 and February 26, 1982. On September 13, 1985, Judge Zobel, in a comprehensive and carefully detailed Memorandum of Decision, found Kodak had infringed twenty claims of seven valid Polaroid patents. Two patents were found invalid. One was found not infringed. One was found invalid before trial and Polaroid withdrew its claims on another patent before trial. Judge Zobel did not assign to any single patent credit for the success of integral instant cameras and film, but found that integral instant photography, as commercialized by Polaroid and Kodak, relied on the inventions of the seven patents held valid and infringed. Judgment was entered on October 11, 1985, and, on January 8, 1986, Kodak was enjoined from further infringement of the five patents which had not yet expired. The damages issues were reserved to the post-liability phase of the bifurcated trial. *Polaroid Corp. v. Eastman Kodak Co.*, 641 F.Supp. 828 [228 USPQ 305] (D.Mass.1985), stay denied, 833 F.2d 930 [5 USPQ2d 1080] (Fed.Cir.), aff'd, 789 F.2d 1556 [229 USPQ 561] (Fed.Cir.), cert. denied, 479 U.S. 850 (1986).

The story of this case to date is told in the foregoing trial and appellate opinions. That story will not be

retold here except where necessary for a complete understanding of the particular issue under consideration. Suffice to say that this case involves not only the patents, but the history of a new industry, that of integral instant photography. It involved from the outset the only two competitors in the field, locked in a bitter, unyielding exhausting and expensive litigation for over fourteen years, and the struggle has not yet ended. This is the latest, but probably not the last time the parties confront each other.

The precise issues that were reserved for this phase of the litigation are:

1. Whether Kodak's infringement of any one or more of the patents in suit was willful and deliberate.
2. The amount of damages adequate to compensate Polaroid for Kodak's infringement, together with interest, and whether such damages should be increased up to three times the amount found, all in accordance with 35 U.S.C. § 284.
3. Whether costs shall be taxed against either party.
4. Whether Polaroid is entitled to its reasonable attorneys' fees because this is an "exceptional case" within the meaning of 35 U.S.C. § 285, and if so, the quantum of those fees.

Polaroid Corp., *supra*, 641 F.Supp. at 878.

The overriding issue, which therefore commands the greatest portion of this opinion, is determining the amount of damages adequate to compensate Polaroid for Kodak's infringement. In this introduction, I describe the trial as it was conducted. I follow with the elemental legal principles which I kept constantly in mind as I considered particular issues. I then set out the pivotal questions and my approach to those questions.

*2 This case came before me for trial without jury. The trial lasted ninety-six days. Polaroid rested its case after fifty days, calling twelve witnesses, and introducing hundreds of exhibits. It also submitted portions of the depositions of an additional seventy-three witnesses. Kodak rested its case after forty-six days, calling fifteen witnesses, introducing hundreds of exhibits, and submitting portions of the

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depositions of seventy-one Polaroid witnesses, one Kodak witness, and fourteen non-party witnesses. Experts of national repute were presented by both sides to render their opinions of what *would* have happened in a world that never existed. They testified as to what management strategy, planning, and control would have been in a world without Kodak. They testified about marketing capability, about camera and film manufacturing capabilities, and produced econometric models to fortify their conclusions. They testified about cost accounting methods, reasonable royalty rates, interest rates, and the basis upon which to calculate interest. Their opinions were predictably, and discouragingly, widely disparate on almost every point.

The case presented many difficult and intricate factual questions. There were broad, sweeping questions of corporate vision, motivation, and management decision-making. There were discrete, narrow questions of product forecasting, product quality, manufacturing processes, and costs. The case also presented complex legal questions unique to the instant photography industry and its market. One most difficult problem was avoided. Just as Judge Zobel did not single out any one patent to credit with the success of integral instant photography, the parties here have treated the patents as a group for the purpose of a damage award. Assessing damages for the infringement of each patent individually based on that patent's contribution to the product would have added a hopelessly complex analysis to an already complex trial and was well avoided.

Not surprisingly in a case of this magnitude, lead counsel for both sides divided up the issues, assigning counsel exclusively to prepare and present specific segments such as manufacturing capacity, marketing, costs, willfulness, and royalty rates. Experts were not deposed prior to trial, but their reports were submitted and exchanged. Except for one area-- willfulness--counsel had years to prepare their assignments and their witnesses. One positive result was an efficient trial with minimum delay and interruption except as necessitated by my schedule and docket demands. One negative result was a highly stylized, very technical presentation. The only surprise was that despite sharing all of the evidence that was ultimately produced at trial among all of the experts, the parties' positions were irreconcilably apart in every area. It was necessary to forge an independent course in technical, complicated areas in an effort to reach a principled result. I believed then, and continue to believe, that this matter could and should have been resolved by

the parties at enormous savings to themselves, and to the resources of the court.

*3 Throughout the trial, I kept in mind fundamental guidance. The recovery of damages for patent infringement is governed by 35 U.S.C. § 284. Section 284 reads, in relevant part:

Upon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer, together with interest and costs as fixed by the court.

The U.S. Supreme Court defined damages contemplated by the statute as follows:

[T]he present statutory rule is that only "damages" may be recovered. These have been defined by this Court as "compensation for the pecuniary loss he [the patentee] has suffered from the infringement...." They have been said to constitute "the difference between his pecuniary condition after the infringement, and what his condition would have been if the infringement had not occurred."

Aro Mfg. Co. v. Convertible Top Co., 377 U.S. 476, 507 [141 USPQ 681] (1964) (citations omitted).

[1] The law recognizes two possible measures of recovery, lost profits or a reasonable royalty. Under either method, the purpose is the same: to compensate the patentee for actual injuries. [FN1] The choice between the lost profits method of determining damages and the reasonable royalty method has been explained as follows:

The general rule for determining the actual damages to a patentee that is itself producing the patented item, is to determine the sales and profits lost to the patentee because of the infringement. Although the statute states that the damage award shall not be "less than a reasonable royalty", 35 U.S.C. § 284, the purpose of this alternative is not to provide a simple accounting method, but to set a floor below which the courts are not authorized to go.

Del Mar Avionics, Inc. v. Quinton Instrument Co., 836 F.2d 1320, 1326 [5 USPQ2d 1255] (Fed.Cir.1987). Lost profits are the preferred measure of damages. Therefore, I begin my analysis with a determination of lost profits.

Both sides recognize the approach to lost profits set

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out in *Panduit Corp. v. Stahl Bros. Fibre Works*, 575 F.2d 1152 [197 USPQ 726] (6th Cir.1978). To meet the *Panduit* test, Polaroid must prove: (1) demand for the patented product in the market; (2) the absence of an acceptable non-infringing substitute; (3) its manufacturing and marketing capability to exploit the demand; and (4) a detailed computation of the amount of profit it would have made. *Id.* at 1156. Polaroid's burden of proof on the lost profits is not absolute, but one of "reasonable probability." *Paper Converting Machine Co. v. Magna-Graphics Corp.*, 745 F.2d 11, 21 [223 USPQ 591] (Fed.Cir.1984). Doubts concerning the calculation of lost profits must be resolved against the infringer. *Del Mar Avionics, Inc.*, 836 F.2d at 1327.

Beginning with the *Panduit* lost profits method, even if it is later decided that a reasonable royalty is more appropriate for some years, the question of demand must be resolved first. Everything else flows from demand. While issues such as manufacturing capacity are extremely complicated factually, they are not conceptually difficult. The question of demand, however, contains at least two profound conceptual problems.

*4 The first problem is the question of market expansion. It has both legal and factual elements. Initially, I will investigate the legal standard to be applied and see what type of factual questions the rule leaves open. I will consider the evidence of market expansion. There is some direct evidence, such as predictions and contemporaneous statements about market expansion. The bulk of the evidence is inferential, however. There is testimony of Polaroid and Kodak executives about what happened in the relevant years and consumer market research examining the question of why people bought instant cameras. There is expert testimony of Professors Dolan and Buzzel, based upon their surveys of market conditions, historical sales, and market research. There is expert testimony of Professors Fisher and Baumol, based on their econometric models.

The second problem is intimately related to the first; it is the question of translating Kodak sales into Polaroid sales in the world without Kodak, the "but for" world, or to put it more directly, what price Polaroid could have charged for the additional camera sales in the world without Kodak. The only undisputed fact is that quantity and price of the cameras and film Kodak did sell in the infringing years.

Once those questions are resolved, I will turn to marketing and manufacturing capability, costs, and other issues in the following order: an overview of the historical background of the case and the parties' positions (Section II); the instant photography market (Section III); Polaroid's manufacturing capacity (Section IV); costs (Section V); the calculation of lost profits (Section VI); the calculation of the reasonable royalty rate (Section VII); willfulness (Section VIII); attorneys' fees (Section IX); and prejudgment and postjudgment interest (Section X). My conclusion and a summary of the award appears in Section XI, followed by the appendices [omitted].

This introduction closes with my acknowledgement that this opinion is lengthy, partly because my findings and conclusions contain specific references to certain witnesses, events, or exhibits. Those references should not be construed as the most critical portions of the record. I considered the entire record, whether produced through trial witnesses, deposition, exhibits, or stipulations. Not only were witnesses in sharp disagreement, but thousands of pages of documents, dredged up from long dormant corporate files by industrious counsel over years of discovery, often contained statements, sometimes by the witness or by associates, which appeared to belie the position taken at trial. When confronted with these inconsistencies or discrepancies, witnesses sought to put their own "spin" on the statements. For example, conflicting views in marketing studies were sometimes ignored, or dismissed out of hand, or disparaged as "half ideas" or "half truths," or a "rare sensible comment." Of course, I assessed a witness's credibility, and weight to be given the testimony, on the usual criteria of fairness, motivation, candor and demeanor of the witness. In accepting or rejecting positions, I make specific references to the record when I find the testimony or exhibit particularly compelling or illustrative.

II. AN OVERVIEW

*5 Edwin H. Land, the founder of Polaroid, began work on instant photography in 1944. In December 1948, Polaroid introduced the first instant cameras and film. Instant photography created a sensation, even though it required special handling. In order to develop the film after taking the picture, the user had to time and pull the print out of the camera, peel off and dispose of a protective chemical-laden paper backing and apply a special coating to the final picture. The cameras were heavy and bulky. Over time, Polaroid refined the early system, developing

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more sophisticated technology, better design and appearance, better quality photographs and, finally, color prints. [FN2] Still, even as late as 1971, the user still had to peel away the protective layer from the finished print.

The peel-apart business was a profitable one for Polaroid. In the early years of pack camera sales, 1963-1969, Polaroid grew three and a half times with after-tax profits averaging above thirteen percent of sales. After the initial learning curve was mastered, gross margins for peel-apart film were in the range of fifty to sixty percent and gross margins for cameras were in the range of forty to fifty percent. Despite these margins, however, the technology problems of the system kept it from being attractive to the average consumer and, as later marketing research showed, made a lasting negative impression on the public. Even as late as 1979, seven years after the peel-apart system was replaced, many people still associated Polaroid photography with the messy peel-apart product.

In 1972, Polaroid introduced a sleek folding camera, the Model SX-70. The film used with this camera developed without any special handling by the user and, because the film was exposed and viewed from the same side, the peel-off, protective paper was eliminated. Perhaps the most amazing feature of the SX-70 system was that the picture developed before the eyes of the consumer. The SX-70 was so revolutionary that both *Time* and *Life* magazines reported its introduction as a cover story in 1972.

Although almost a million SX-70 cameras were sold in 1974, a record for cameras priced over \$100, Polaroid did not earn a satisfactory profit on this model. First, Polaroid predicted greater demand in 1973 and 1974 than actually materialized. Therefore, when sales failed to measure up, Polaroid was forced to cancel the planned construction of additional manufacturing facilities and lay off workers. Second, the first three years of SX-70 production were plagued with manufacturing problems. For the first time in its history, Polaroid manufactured many of the components for its cameras instead of contracting with outside vendors for their production. Modules were always in short supply. The precision plastics and the film batteries also created a great deal of trouble. Not until 1975 did Mr. William McCune, then Chief Executive Officer of Polaroid, believe that all the SX-70 problems had been worked out.

*6 These problems chipped away at both Polaroid's

profit margins and its public image. The company had been aiming for a profit margin of forty to fifty percent on cameras and between fifty and sixty percent on film, but they never came close to achieving these goals. In 1974, Polaroid sold SX-70 film at a loss. A battery problem required costly repair and the company had to give away a great deal of replacement film. Manufacturing difficulties kept Polaroid from meeting the demand for cameras in 1973. These problems also hurt Polaroid's image with consumers; SX-70's problems were well publicized and market research as late as 1978 revealed lasting negative impressions of the SX-70 system.

The "top of the line" SX-70 was originally priced at \$120 and remained at that price until 1976. Polaroid did not raise prices for fear demand would be adversely affected. (TR 910, DF 20,2404). [FN3] In 1974, Polaroid introduced the SX-70 Model 2, a slightly less sophisticated camera which sold for \$102. In 1975, Polaroid went one step further and introduced the Model 3, priced at \$83, \$13 below Polaroid's cost to manufacture the camera. Sales of Model 3 were particularly disappointing. In 1975, total SX-70 sales fell to 741,000 units. By 1976, Polaroid had invested about \$600 million on the SX-70 project.

In March of 1976, Polaroid introduced the Pronto!, a non-folding integral camera, which retailed for approximately \$60. Polaroid had begun work on the Pronto! as early as 1973, aiming to incorporate the new integral technology, but making the camera simpler to produce, thereby increasing gross profit margins to a goal of forty percent. The Pronto! body was one piece of precision plastic molding which required only a single screw. It did not have the SX-70 through-the-lens viewing, but it used SX-70 film. As early as 1970, Polaroid had received strong signals that Kodak was going to enter the instant market, but Mr. McCune testified that the design, price and timing of the introduction of the Pronto! would not have been any different without Kodak's entry in the market. In 1976, Polaroid sold 1,788,000 Pronto! cameras worldwide.

In April 1976, Kodak introduced its infringing EK-4 and EK-6 cameras in Canada. In response to the Pronto! price, Kodak changed the introductory U.S. retail prices for these hard-body models to bracket the Pronto!. The non-motorized EK-4 was priced slightly below and the motorized EK-6 slightly above the Pronto!. However, net dealer prices positioned the EK-6 at about the same price as the Pronto! and

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the EK-4 about \$10 below. Kodak cameras were boxier and heavier than the Pronto! and the EK-4 required the user manually to eject the picture by turning a hand-operated crank. The cameras were moderately successful; Kodak sold 501,500 EK-4s and 610,000 EK-6s in 1976 despite some negative reports in the press about picture quality. Still, with only one month's headstart, Pronto! far out-sold EK-4 and EK-6 in 1976.

*7 Kodak initially priced its instant film, PR-10, only three cents lower than SX-70 film despite the fact that PR-10 did not contain a battery and, thus, compared to Polaroid film, was overpriced. PR-10 produced a rectangular picture with rounded corners compared to the square SX-70 prints. In addition, Kodak prints had matte finish as opposed to the glossy finish of the Polaroid prints. As with the SX-70 film, Kodak experienced initial quality problems, particularly fading.

In 1977, the instant photography business continued to grow rapidly and the competition between Polaroid and Kodak intensified. In March, Kodak announced the upcoming May introduction of the EK-2 model, which came to be commonly known as the "Handle." [FN4] The Handle was a fixed focus camera that required no special optical mirrors to direct the light path. This design reduced cost, weight, and the chance of consumer error. Like the EK-4, the Handle featured a manual crank to eject the picture. Kodak priced the Handle at \$26.98 dealer low net expecting product-feature parity with Polaroid models. However, the Handle announcement had the effect of a "bombshell" at Polaroid. (TR 218).

Work on a low-priced camera had begun before the Handle announcement and Polaroid was able to respond by bringing the OneStep, a fixed-focus version of the Pronto!, to the U.S. market in June. It was dealer priced at \$28. The OneStep, which Polaroid produced in about three months time at a capital cost of only \$250,000, was its best selling camera ever. Contrary to Polaroid's claims that the simple OneStep hurt the quality image of instant photography, a 1978 study of OneStep owners concluded that "OneStep owners expressed the highest satisfaction level of any owners ever surveyed." (DF 20,687).

The instant camera market exploded in 1978. Polaroid's worldwide amateur camera sales increased approximately thirty-two percent over 1977 levels. Both companies accumulated significant backorders for cameras; Mr. McCune reported to the Polaroid

Board of Directors several times during that year that demand was exceeding supply for both cameras and film. Despite all of this selling activity, however, the new integral era was not as profitable as the pack camera era had been. Mr. McCune reported that although sales had increased sixty-eight percent over 1968 pack-era levels, profit was only seventy-one percent of what it had been. (PT 2082). Polaroid executives blamed this loss of profit on Kodak's competitive presence which they claimed prevented them from increasing prices.

From May 1977 to July 1978, Kodak gradually lowered its price to dealers on the Handle by offering dealer rebates and bonus discounts such as introductory specials. In July 1978, Kodak was selling Handles to dealers at cost, about \$18.95. Although the Kodak camera was non-motorized, Polaroid executives testified that they felt compelled to bring prices down on both their motorized and folding cameras. [FN5] Polaroid lowered the price of the SX-70 by \$25.50 and offered the Pronto Rangefinder, the fanciest camera in the Pronto line, at \$15.50 less by removing the tripod mount and the timer.

*8 Sales began to slow in 1979. I. McAllister Booth, Polaroid's Vice President in charge of manufacturing, testified that retail prices were off, the earlier projections were not holding true, and Polaroid dramatically changed its expansion plans to avoid building inventories that would not be sold. Although first quarter sales increased about ten percent, by October, Mr. McCune reported that sales for the year were essentially flat. Although sales were still at a high level--the second highest in Polaroid history--Polaroid had planned for the continued, explosive growth rate of 1978. As a result, the company had to make costly reductions in its production schedule. Approximately 800 workers were laid off and the construction of additional production facilities was halted.

Kodak was faring much worse. Even by 1979, Kodak had not turned a profit on its instant business. Although Kodak had anticipated a negative cash flow in the beginning years, it did not expect the turnaround to be so slow. In 1980, when Kodak executives examined the diminished demand and market studies which indicated that no relief was in sight, they considered abandoning the instant business. However, while in the throes of this fast-paced competition, Kodak introduced three new models in 1979, only one of which represented a significant price cut. The non-motorized Handle 2

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was packaged with a case at a net dealer price of \$19.95 and shelf price of \$22.95. In late 1979, that price was lowered to \$17.95. The other two models were priced at or above the OneStep. The CB50, a motorized camera, was dealer priced at \$26.95. The CB250 was more in the mid-range; it had a built-in strobe and a shelf price of \$54.95.

In early 1980, Polaroid introduced a significant innovation: Time Zero film, which reduced the ex-camera development time by half. Dr. Land had always dreamed of truly instant pictures. Indeed, his goal was a photograph that emerged from the camera completely developed. Mr. Booth testified, however, that the urgency propelling Time Zero to market in early 1980 was Dr. Land's insistence on Polaroid's need to compete better with Kodak, "to beat Kodak." (TR 2198). Time Zero caused a drain on the company's resources and forced other projects to the back-burner. But Mr. Booth testified that he believed that without Kodak in the market, Time Zero film would never have been developed. Instead, Polaroid would have focused its efforts on the Sun camera series and brought them to market earlier.

Polaroid sold the most film in its history in 1980. Camera sales, in contrast, continued to decline as did their profitability. Polaroid introduced "The Button" camera in August 1980, but it was nothing more than the OneStep with a new finish, priced about \$10 less. Between 1977 and 1980 the margin on the OneStep decreased fifty percent. The margin on film remained the same but during this time period, the price of SX-70 film, in constant dollars, actually declined from \$4.64 to \$4.06.

⁹ Both Kodak and Polaroid recognized that the key to increasing profit in this period was to raise prices but were apprehensive about how price increases, especially on film, would affect demand. While mindful of the keen competition within the instant camera market, both companies were increasingly concerned with the growing threat of conventional 35mm photography and advances in photofinishing quality and speed. Polaroid began studying the 35mm photofinishing business in 1979. By the early 1980's 35mm photography had dropped in price so as to compete directly with instant photography. In 1981, Mr. McCune asserted that, "I think we could all agree that our major competition comes from conventional photography--not Kodak instant. It is 35mm sales that have grown at the expense of instant." (DF 61,742). In 1981, Mr. Booth reported to Polaroid's Board of Directors that the relative price

of instant and conventional prints was a major concern. He reported that anything more than a five percent increase in film price would widen the "already high" two-to-one ratio between the price of an instant and conventional print.

The introduction of Time Zero film gave Polaroid the chance to raise film prices by six percent in March 1980, double the usual annual increase of three percent. This increase followed a Kodak increase in January 1980. In January 1981, Kodak again increased its film prices, this time by almost ten percent. Polaroid followed Kodak's lead in February. During this time period, Kodak also began to concentrate its efforts on the premium channel of distribution, selling cameras to companies for use as promotional incentives or prizes. These cameras were sold at a considerable loss to Kodak and generated few film sales.

Polaroid introduced its Sun series of cameras and film in June 1981. The cameras were Polaroid's first models with built-in flash. In combination with the high-speed film, the Sun cameras allowed shorter exposure times, extended indoor flash ranges, and had a smaller aperture opening, which improved the photograph's depth of field. The Sun 660, with state-of-the-art automatic focusing, was dealer priced at \$62.50. The 640 model, without automatic focusing, had a dealer price of \$46.50. Unfortunately, in 1981 and 1982, Polaroid sold only half the number of Sun cameras predicted. 1981 was the first year that Polaroid had an overall negative gross margin on camera sales.

Kodak introduced a new series of its own in 1982. The Kodamatic series included Kodak's lowest-priced camera to date, the Kodamatic Champ, which had a dealer price, after rebates, of \$19.95. Three other cameras Kodak introduced at this time were priced in the mid-range. The top of the line was the auto-focusing Kodamatic 980L which, after rebates, sold to dealers at \$74.45. The Kodamatic 960 low net price was \$49.95 and the 970L was \$59.95. Kodak continued to offer special discount programs to its dealers which lowered these prices somewhat.

¹⁰ In March 1982, Polaroid introduced the lower end of the Sun series line with the Amigo/620, dealer priced at \$37.75. Due to disappointing sales and allegedly to meet the competition from the Kodak Champ, Polaroid decided it had to lower prices further. Later that year, Polaroid simply changed the name of the 640 camera to the Sun 600 LMS, the 660 camera to the OneStep 600, and lowered the price by

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twenty dollars. Not surprisingly, negative margins increased and losses continued. Sales did not increase. Kodak introduced the last in the Kodamatic series in March 1983; the 940 had a dealer low net of \$31.50.

Although the demand for film was significantly less than either Polaroid or Kodak had expected, film margins remained satisfactory and even increased slightly during this period. The price of Polaroid and Kodak film was very close throughout the entire infringement period. Professor Dolan, Polaroid's marketing expert, testified that both companies pursued a policy of "parity pricing." (TR 4112). Mr. Booth testified that Polaroid was concerned that Kodak would not follow any price hike initiated by Polaroid. There was conflicting testimony about whether this concern was reasonable given some increases which Kodak premiered. Overall, although the shelf price of film rose significantly during the infringement period, it increased only fifty-nine percent of the rate of inflation as reflected in the Consumer Price Index.

Around 1982, Kodak was taking a hard look at its strategy in the steadily declining amateur business. At first, the company believed that raising prices and offering better quality photographs was the key to success. When the new Kodamatic line failed to produce large sales, and higher film prices reduced demand, Kodak changed its plans, focusing its sales efforts on large volume users such as insurance companies. Kodak also pulled out of the premium channel, which generated few film sales, and stopped media advertising. From 1983 onward, distribution in consumer channels was reduced significantly. Eventually, in 1984, Kodak decided to pull out of the amateur market completely. By the time it was ordered to leave the market in 1985, Kodak had lost \$600 million on the instant photography business, not including the cost of exiting the market.

Polaroid feared that Kodak would dominate the instant photography field but, in fact, during the entire infringement period, Polaroid maintained the dominant market share for camera and film worldwide. Its lowest worldwide market share for cameras was about fifty-five percent in 1977, but after 1983, it never dipped below sixty-five percent. Its lowest market share for film came in 1980 at about sixty-four percent, but its share topped seventy percent for half of the infringement years.

With a consistently larger market share and more efficient production, Polaroid fared better than Kodak

overall. According to Professor Anthony, a Kodak accounting expert, Polaroid lost \$82.1 million pre-tax dollars on its instant business from 1976 to 1985. In the years following Kodak's departure, Polaroid has raised its film prices to within about eight percent of the Consumer Price Index. In 1987, the average unit price for film went up twelve percent and in 1988 it went up another thirty percent. Not surprisingly, sales of film and cameras decreased in both years. (DF 61,034).

*11 The foregoing overview provides the factual setting for the parties' claims. Polaroid's position is beguilingly simple. It claims that its historical business practices, and the sensible business direction it would have taken, was altered and diverted because it had to respond to Kodak's entry into the instant photography market.

Without Kodak, Polaroid claims it would have continued the growth and profitability it enjoyed in its early pack camera years because of its unique management organization, its innovative style and, above all, the inventive brilliance of its founder and leader, Dr. Edwin Land. Instead, in order to respond to Kodak's entry into the field, it was compelled to alter its usual marketing strategies of introducing lower priced cameras in a systematic and orderly fashion which exploited manufacturing and marketing efficiencies. Aware of Kodak's price-cutting policies and practices, and Kodak's enormous power in the entire photography field, Polaroid claims it was not free to price its products at levels which would have brought it into line with its historical margins. Polaroid claims that Kodak forced it into a fierce price war which was inimical to its traditional style, and, as importantly, to its image as the innovative, inventive leader in instant photography.

Polaroid also claims it was damaged by what it describes as Kodak's "trashing" or trivialization of instant photography. Because Kodak entered the market with only a lower priced camera, not competing at the higher SX-70 camera level, its advertising, marketing, and pricing practices encouraged consumers to look at the instant camera as a toy or a gimmick, designed mainly for parties or festive occasions, rather than the camera of the future,—a camera which, according to Dr. Land and other Polaroid marketing executives, would eventually replace the conventional camera because it could produce photographs of equal quality with no waiting period. "Why wait?" was Polaroid's marketing theme.

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Polaroid seeks to recover lost profits it would have earned in the world without Kodak, the "but for Kodak" world, during the period it would have enjoyed a lawful monopoly, 1975 through early 1991, when the final Polaroid patent would have expired. [FN6] Under its *Panduit* analysis, Polaroid claims that it would have made each of Kodak's camera sales and each of Kodak's film sales at an incremental profit, albeit at different prices and in a different time frame. In addition, citing its traditional reluctance to grant a license to a competitor, the presumptive validity of the infringed patents, and the bright future for its product as the basis for its negotiation posture, Polaroid seeks, in the alternative, a reasonable royalty rate which approximates its lost profits.

Not surprisingly, Kodak presents an entirely different perspective on compensable damages and a reasonable royalty rate. On lost profits, while not conceding that *Panduit* is the established formula for determining damages, Kodak's position is that even when the *Panduit* formula is used, the result is a much lower award than Polaroid claims. Kodak takes the position that *Panduit* does not create a legal presumption that the demand and market for instant products would have been identical in a world without Kodak, but that Polaroid must prove actual demand for instant photography and not simply add up the total sales by both companies. Kodak also argues that its contribution to the creation or expansion of the market must be considered. Even in a two-supplier market, Kodak asserts, Polaroid must prove that it could have made the infringing sales. Kodak questions whether a separate market for instant photography exists and argues that any analysis of the market must include the impact of conventional photography. Kodak claims that Polaroid's track record of corporate planning and management ability, together with the financial resources available to it, shows that Polaroid *would not* have made the decisions necessary to expand its manufacturing and marketing capacities. And even if Polaroid increased manufacturing substantially, it would have done so at greater costs than it now presents and at a much lower profit than it now posits. Kodak also argues that any profits that are awarded for the infringement period are taxable at the tax rates applicable at the time they would have been made.

*12 Kodak presents several analytical methods of determining a reasonable royalty, and, needless to say, its analysis results in startlingly different figures than those proposed by Polaroid. Kodak traces the

history of licenses in the photographic field and examines the history of licenses between Kodak and Polaroid to arrive at its submission of a reasonable royalty rate in this case. Finally, Kodak disputes strenuously Polaroid's request for treble damages and attorneys' fees.

As stated earlier, the objective of this phase of the litigation is to fairly compensate Polaroid for the injury caused by Kodak's infringement. Of all the approaches suggested, *Panduit* initially presents the clearest roadmap to lost profits. It is a step-by-step, quantifiable method for arriving at a rational, comprehensive, and fair result and is the preferred approach in this case if it results in a fair award. A reasonable royalty rate alternative is unnecessary if Polaroid can prove lost profits. I begin my analysis by setting out my evaluation of the facts and figures in the case to arrive at lost profits. If the result is not satisfactory in light of the objective to fairly compensate Polaroid, I will turn to a reasonable royalty rate as the alternative.

III. THE INSTANT PHOTOGRAPHY MARKET

A. Absence of a Non-Infringing Substitute

Legal Principles and Factual Findings and Conclusions

B. Relationship Between Marketing and Demand in the Market of Instant Photography

Legal Principles and Factual Findings and Conclusions

1. Incredible Shrinking Market Without Kodak, According to Kodak

a. Kodak Sales Attributable to Kodak Name and Kodak Features

Name

Features

Quality

b. Kodak Sales Attributable to Kodak Distribution, Sales Force and Dealer Support

U.S. Distribution

Sales Force and Dealer Relations

International Distribution

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Premium Sales

c. Kodak Sales Due to the Effect of Two Competitors Advertising and Promoting Instant Products

d. Evidence of Market Expansion

2. The Market of the Future, According to Polaroid

a. Polaroid's Historical Pricing Behavior

b. Effect of Higher Prices in Instant Photography Market

This section examines the nature of the instant photography market in order to assess what the demand for instant products would have been in the absence of Kodak's infringement. It includes an examination of whether any non-infringing substitutes for instant photography existed during the infringement period and also considers the effect of competition from conventional photography. It considers whether Kodak's entry expanded the demand for instant products and whether Polaroid had the marketing capability to create and exploit existing demand. Finally, this section concludes with a discussion of the probability and the potential impact on the market of the actions Polaroid claims it would have taken in a Kodak-free world, namely, if it had delayed introducing certain products and charged substantially higher prices.

A. The Absence of a Non-Infringing Substitute.

Legal Principles

*13 In order to recover lost profits the patent owner must show a reasonable probability that but for the infringement it would have made the sales that were made by the infringer. Del Mar Avionics, Inc. v. Quinton Instrument Co., 836 F.2d 1320, 1326 [5 USPQ2d 1255] (Fed.Cir.1987). An integral step in determining whether the patent owner could have made the infringer's sales is to discover whether, during the infringement period, any non-infringing substitutes for the patented product were available which possessed "all the beneficial characteristics of the patented device." TWM Mfg. Co. v. Dura Corp., 789 F.2d 895, 901 [229 USPQ 525] (Fed.Cir.), cert. denied, 479 U.S. 852 (1986). The inquiry is quite narrow; acceptable substitutes are those products which offer the key advantages of the patented device but do not infringe. Central Soya Co. v. Geo. A. Hormel & Co., 723 F.2d 1573, 1579 [220 USPQ 490]

(Fed.Cir.1983). Mere existence of a competing device does not make that device an acceptable substitute. *Id.*; TWM Mfg., 789 F.2d at 901. In markets where non-infringing alternatives are available, the court must determine what portion of the purchasers of the infringing product would have purchased the substitute instead of the patented product. See, e.g., Amstar Corp. v. Envirotech Corp., 823 F.2d 1538, 1543 [3 USPQ2d 1412] (Fed.Cir.1987).

Findings and Conclusions

There is no genuine dispute between the parties on this issue. Both agree that the instant feature is the "beneficial characteristic" of instant photography and that no other suppliers of instant photography existed in the market. [FN7] (See Polaroid's Post-Trial Submission at Facts-I, at 19; Kodak's Post-Trial Submission at Facts (Topic I), at 8, n. 10). However, there is substantial dispute between the parties concerning the extent to which conventional photography influenced the demand for instant photography and the extent to which that influence may be considered in light of the finding that conventional photography was not an acceptable non-infringing substitute during the infringement period.

At various times during the trial Polaroid seemed to argue that all evidence about conventional photography should be excluded because conventional photography was not an acceptable substitute for instant photography. (See, e.g., TR 6699-702; 11134-35). Kodak argued that conventional photography was an "economic substitute" for instant. (Kodak's Post-Trial Submission Facts (Topic I), at 8, n. 10 and Law (Topic I), at 7, n. 5). Kodak did not attempt to quantify the number of Kodak instant purchasers who would have turned to conventional products in Kodak's absence; Kodak simply urged that the relative price of instant and conventional photography was a significant variable in the demand formula for instant products and therefore must be considered in any assessment of the market. (TR 11134-35; 11312-15).

Instant photography occupied a unique niche in the overall photography market during the infringement period. Consumers sought the emotional "instant experience" of having a picture develop immediately, usually in the presence of the subject. (See e.g., PT 2409, PT 2454, and discussion in Section B, Part 1(a)). Although instant photography was unique, it did not exist in a vacuum; it also competed with conventional photography for the consumer's

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photographic dollar. (See discussion in Section B, Part 2(a) and (b)). Those who purchased infringing Kodak instant products at Kodak prices would not have considered conventional products as an acceptable substitute at the time of purchase, but the relationship between the relative advantages of conventional and instant photography was an integral part of each consumer's decision. If Polaroid were simply claiming that it could have made Kodak's sales at the same time at similar prices, there would be no question in my mind that consumers would have made the same choice vis-a-vis conventional photography. However, Polaroid's claim is not so simple.

*14 Polaroid's experts spun a scenario in which the prices Polaroid would have charged were substantially higher and in which, through a complicated massaging of the demand curve, the great bulk of sales would have occurred later than they did historically. In this "but for" scenario, the effect of conventional photography on the instant photography market must be considered. The evidence of competition between instant and conventional products is overwhelming. Even Polaroid's econometric expert attempted to include the effect of competition from conventional photography in his computation. The relative values of instant and conventional changed throughout the period of infringement. On the facts before me, I must consider that relationship when deciding whether Polaroid's scenario, which differs so substantially from the historical world, is feasible.

[2] Contrary to Polaroid's urging, the law does not require this Court to ignore the effect of competitive forces on the market for patented goods just because there are no non-infringing alternatives. Indeed, the law requires a careful assessment of all market influences when determining lost profit or reasonable royalty damages. State Indus., Inc. v. Mor-Flo Indus., Inc., 883 F.2d 1573, 1581 [12 USPQ2d 1026] (Fed.Cir.), *reh'g denied*, 1989 U.S.App. LEXIS 14711 (Fed.Cir.), *reh'g denied en banc*, 883 F.2d 1573, --- U.S. ---, 110 S.Ct. 725 (1990) (although fiberglass was not a non-infringing alternative to the patented foam insulation, the two were in direct competition and therefore, it was in the district court's province to consider that fact in assessing the appropriate reasonable royalty rate); Water Technologies Corp. v. Calco, Ltd., 850 F.2d 660, 673 [7 USPQ2d 1097] (Fed.Cir.), *cert. denied*, 488 U.S. 968, 109 S.Ct. 498 (1988) (as a basis for reversing the district court's award of lost profits, the court held that a finding of but/for causation was negated by the

finding that the patentee's price significantly exceeded that of the infringer); Paper Converting Mach. Co. v. Magna-Graphics Corp., 745 F.2d 11, 21 [223 USPQ 591] (Fed.Cir.1984) (in considering the magnitude of demand in a two-seller market, the court upheld the district court's consideration and rejection, on factual grounds, of the infringer's claims that consumers of the patented product would have foregone the purchase except for their lower price; Pfizer, Inc. v. International Rectifier Corp., 218 U.S.P.Q. 586 (C.D.Cal.1983) (in deciding what demand would have been for certain prescription drugs in the absence of infringement, the court considered price and demand elasticities and competition from other non-infringing drugs).

I find that conventional photography was not an acceptable substitute for instant photography during the period of infringement. Competition between conventional and instant photograph (which changed throughout the ten years of infringement) did, however, affect the price that consumers were willing to pay for instant photography. Therefore, in Section B, Part 2, I have assessed what effect the competition would have had on Polaroid's ability to charge more for its instant products and on the profitability of delaying the introduction of certain lower-priced products.

B. The Relationship Between Marketing and Demand in the Market for Instant Photography.

Legal Principles

*15 On its face, the inference that in a two-seller market, but for the infringement, demand for the patented product equals the combined sales of the patent owner and the infringer seems reasonable. Lam, Inc. v. Johns-Manville Corp., 718 F.2d 1056 [219 USPQ 670] (Fed.Cir.1983). The rationale supporting this inference is the idea that when the infringement was occurring, the combined sales represent the number of consumers who desired the patented product. See Livesay Window Co. v. Livesay Indus. Inc., 251 F.2d 469, 473 [116 USPQ 167] (5th Cir.1958).

[3] The law looks behind the facial appeal, however, and requires more of the patentee. The patent holder must show that it had the marketing capability to make the sales. State Indus., 883 F.2d at 1577; Datascope Corp. v. SMEC, Inc., 879 F.2d 820, 826-27 [11 USPQ2d 1321] (Fed.Cir.), *reh'g denied en banc*, 879 F.2d 820, (Fed.Cir.1989), *cert. denied*, 493 U.S. 1024, 110 S.Ct. 729 (1990). Typically this requires proof of factors such as an adequate

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distribution system and sales personnel. See, e.g., Datascope Corp., 879 F.2d at 827 (upholding the district court's determination that the patentee was not entitled to lost profits on infringer's foreign sales of heart catheters because patentee had no sales representative's assigned to foreign customers and never made "inroads in the area"); Yarway Corp. v. Eur-Control USA, Inc., 775 F.2d 268, 276 [227 USPQ 352] (Fed.Cir.1985) (upholding the district court's decision to award the patentee profits on only eighty-five percent of the infringer's sales of desuperheaters because of court's finding that some buyers might not be aware of the patentee and thus not purchase from it). This factual inquiry is consistent with the role of marketing in markets where demand is relatively inelastic or dependent on variables outside the seller's control, such as a rate of new construction or population growth. See Ryco, Inc. v. Ag-Bag Corp., 857 F.2d 1418, 1427 [8 USPQ2d 1323] (Fed.Cir.1988). In those situations marketing has a dual purpose: to make the availability of the product known and then a sort of "clean up" operation to get the product to those who need it.

[4] Kodak claims that demand and marketing in the instant photography market are not as neatly severable as in the recorded cases. It claims instead that determining demand in the absence of infringement requires a careful examination of the parties' actual marketing capabilities. I agree.

In this respect, the instant photograph market may be unique. Instant cameras are discretionary luxury items usually purchased as gifts. (TR 8043-46). Therefore, sales are highly susceptible to the influences of marketing: advertising, name and reputation, product design strategies, in-store promotion and demonstration. (TR 8039-42; 8046-47). Consumers are motivated both by the invention itself and its marketing. Answering the question of how many of Kodak's sales Polaroid would have made depends, in part, on determining what unique marketing influences, if any, Kodak brought to bear on the marketplace. Potential influences include the Kodak brand name, advertising, any unique product or service offerings, as well as such garden variety marketing topics as distribution channels and the level of sales support. To simply assume, as Polaroid urges, that the demand for instant products absent Kodak's illegal entry would be the total sales actually made by both companies is analytically flawed, for it fails to consider *why* consumers purchased instant cameras and ignores the unique facts of this case.

*16 The Federal Circuit has recognized that limited marketing capability may curb an award for lost profits, but has not discussed it in terms of stimulating demand. Datascope Corp., 879 F.2d at 827; Yarway Corp., 775 F.2d at 276. Even the parties basically agree on the critical topics; they just do not agree whether the focus should be on Polaroid's marketing capability or Kodak's expansion of demand. (See exchange at TR 4319-20). Polaroid believes the appropriate marketing capability topics are products, pricing, advertising and promotion, and distribution. (Polaroid's Post-Trial Submission Facts-II, at 5-14). Kodak believes that the means by which it expanded demand were name and reputation, marketing efforts, product variety and features, advertising and promotion, sales force, dealer support, and distribution. (Kodak's Post-Trial Submission Facts (Topic II), at 1). For the topics common to both parties, it is only a question of semantics: do these factors stimulate or facilitate purchasers? In either case, if Kodak offers something unique and critical to those purchases, Polaroid cannot prove lost profits on those sales.

I would like to emphasize that it is not a question of whether Kodak's marketing acumen was better than Polaroid's or whether consumers preferred Kodak to Polaroid. It is a question of whether any unique Kodak marketing influence was essential to significant consumer interest in instant photography. Only in that case can it be said that demand would be diminished in Kodak's absence.

The main dispute between the parties on this issue is over the extent to which the effect of Kodak's name and reputation on the market may be considered in determining what sales Polaroid could have made absent the infringement. Polaroid argues that customer brand preference is irrelevant to the question of demand. Datascope Corp., 879 F.2d at 825. I disagree with this reading of Datascope. Datascope involved the sale of a heart catheter, which, through the operation of a percutaneous balloon, allowed doctors to clear blocked arteries. Datascope Corp. v. SMEC, Inc., 594 F.Supp. 1306 [224 USPQ 694] (D.N.J. 1984), *aff'd in part and rev'd in part*, 776 F.2d 320 [227 USPQ 838] (Fed.Cir.1985) (infringement). Before this invention, doctors were required to insert catheters through surgery which required more time, more anesthesia, and caused the patient more pain than with the percutaneous method. Datascope Corp. v. SMEC, Inc., 678 F.Supp. 457, 459-60 [5 USPQ2d 1963] (D.N.J.1988), *aff'd in part and rev'd in part*,

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879 F.2d 820 [11 USPQ2d 1321] (Fed.Cir.1989) (damages). The district court held that early in the infringement period, many of the infringer's sales were made because of doctors' confidence in the president of the company and that many of the infringer's customers would not have switched from using surgical balloons to percutaneous balloons but for that faith in the infringer's president. Datascope Corp., 678 F.Supp. at 459-60. The court held that the patentee was not entitled to lost profits and instead awarded a reasonable royalty. *Id.* at 462-64.

*17 The Federal Circuit reversed this finding not because it found customer preference to be irrelevant to the question of demand, but rather because it found it irrelevant to the question of marketing capability. Datascope Corp., 879 F.2d at 825. The circuit court explained that if customer preference were relevant, it would be relevant to the question of demand:

The question at this point in the appeal, rightly stated, is whether [the infringer's] showing that the loyalty of some of its customers overcame the reasonable inference (when the patentee and the infringer are the only suppliers of the patented product) that the patent owner would have made the sales made by the infringers. It did not. The district court found, and [the infringer] does not challenge the finding, that those sales would have been made by [the patentee] (albeit later): "[R]egardless of the doctors' high regard for [the infringer's president and the infringer], these doctors would have adopted the percutaneous method because of [its] advantages [over prior art methods]."

Id. at 826 (citations omitted). In other words, the court is saying that preference may be relevant to demand but because of the advantages of patented invention over prior art the court had already determined that demand equalled the combined sales of the patentee and infringer. In medical science, an undisputed improvement is inevitably adopted. The nature of this special market made customer loyalty, which may have existed when the invention was new, inconsequential.

[5] In our case, demand is much more complex. Instant photography is unique but it cannot be compared to an inevitable next step in medical science. Demand for instant products did not depend on an independent variable, such as the number of blocked arteries. Like the demand for other mass market consumer goods, the demand for instant photography was subject to the whim of consumers who, in deciding where to spend their discretionary

income, may have been influenced by brand name. I believe Datascope compels this Court to examine whether loyalty to the Kodak brand name can overcome the otherwise reasonable inference that consumers bought instant cameras because of the patented features owned by Polaroid.

Polaroid argues that if this Court is allowed to open the inquiry to include the effect of Kodak's marketing efforts on demand, and if the infringer enjoyed established marketing clout, few, if any, patentees would be entitled to lost profits. I do not believe this is so. First, the patent owner is only required to prove the reasonable probability that it would have made the sales. The patent owner need not prove causation as a certainty, nor must it negate every possible purchase of another product. *See, e.g., Water Technologies Corp.*, 850 F.2d at 671; Gyromat Corp. v. Champion Spark Plug Co., 735 F.2d 549, 553 [222 USPQ 4] (Fed.Cir.1984); Lam, Inc., 718 F.2d at 1065. Moreover, when the amount of damages cannot be ascertained with precision (in the present case because it is impossible to sort out the various effects on the marketplace), any doubts regarding the amount must be resolved against the infringer. Story Parchment Co. v. Paterson Parchment Paper Co., 282 U.S. 555, 563 (1931). The infringer's marketing clout must be significant and critical in order to overcome this protection.

*18 Second, demand is not a function of marketing in every case. Where the two are intimately related, however, I believe the parties' relative capabilities must be assessed in order to determine what the patent owner has lost as a result of the infringement. The Federal Circuit has considered a price differential between the patented goods and the infringing goods as relevant to demand even when there were only two suppliers of the patented good. Water Technologies Corp., 850 F.2d at 673; Paper Converting Mach. Co., 745 F.2d at 21. The same reasoning applies in this case to any differences in marketing capabilities.

Of course, if a patentee's product is infringed by a company with unique marketing capabilities, in a market where demand depends, to some extent, on those abilities, the patentee is still entitled to damages. Although the award of lost profits is the preferred measure of damages, where lost profits cannot be proven, the patentee is not left out in the cold but is entitled to a reasonable royalty, sufficient to compensate for the infringement. Fromson v. Western Litho Plate & Supply Co., 853 F.2d 1568, 1574 [7 USPQ2d 1606] (Fed.Cir.1988); Stickle v.

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Heublein, Inc., 716 F.2d 1550 [219 USPQ 377] (Fed.Cir.1983).

It is impossible to prove what purchasers of Kodak instant cameras would have done in a world without Kodak; it is not Polaroid's burden to do so. Polaroid must show, however, that a reasonable probability exists that those consumers would have purchased Polaroid cameras. To determine whether Polaroid could make those sales, I must examine *why* they purchased Kodak. That inquiry necessarily entails an exploration of the effect of Kodak's marketing efforts. While Kodak's entry may have been critical to a few sales here and there, I find that it was not critical to most.

Factual Findings and Conclusions

Introduction: The Parties' Factual Claims About Demand and Marketing Capability

Kodak claims that its market entry triggered the boom in instant photography and that competition from conventional photography touched off its decline. Kodak bases this claim, in large part, on Professor Baumol's econometric model, which attempts to explain and quantify the various forces at work in the market. Kodak concluded that its presence expanded the market by about seventy-five percent. Kodak's reputation, product offerings, advertising, sales efforts, and distribution were the reasons for this market expansion, Kodak concluded.

I will analyze these claims in reverse order. In Part I, I will first determine whether there is any evidence that some offering unique to Kodak brought a significant number of consumers into the market. The parties' relative marketing capabilities are a part of this analysis although, depending on the topic, the nomenclature of economics is not always appropriate. Having examined any mechanisms by which Kodak may have expanded the market, I will review Professor Baumol's model and other evidence of market expansion offered by Kodak.

*19 Although Polaroid claims that it could have made all of Kodak's sales during the infringement period, it believes the demand would have looked entirely different without Kodak. Demand would not have peaked in 1978 but would have grown more slowly and, by 1990, Polaroid would not only have sold every camera Kodak sold from 1976 to 1985, but would have sold both these additional cameras and every Polaroid camera historically sold at significantly higher prices. This conclusion is based largely on Professor Fisher's econometric model

which sought to measure the effects of certain market variables. Professor Fisher used this model not only to explain but to predict what sales would have been without Kodak, given various sets of prices and camera model introduction dates. His conclusion was that but for the infringement, Polaroid could have made a profit, with interest, of over \$3.9 billion dollars.

In Part 2, I will examine Professor Fisher's model for its soundness and reliability and I will consider whether Polaroid's pricing and introduction decisions would have happened as he and other Polaroid witnesses testified. I will also assess the effect of such decisions on the market and on Polaroid's potential profits.

1. The Incredible Shrinking Market Without Kodak, According to Kodak

I believe that the law requires this Court to address the question of whether Kodak contributed something unique to the market such that without Kodak, consumers would not have purchased instant photography. As demand for instant photography is heavily influenced by marketing, one way in which this question can be narrowed is to ask: Can any factor be identified that was both unique to Kodak marketing and critical to consumers' desire to purchase an instant camera? From this flows a discussion of the Kodak name and reputation and Kodak product features in Section (a).

The same question in a different form is whether Kodak's distribution in the United States and abroad was critical to the sales made through those channels. Could Polaroid have made those sales? Were Kodak's salespeople and their relationship to dealers critical or merely incidental to sales? This is the more typical marketing capability analysis and is covered in Section (b).

In Section (c) I will consider the effect of Kodak's advertising and promotion. This inquiry differs slightly from the first two because instead of claiming that its advertising was unique, or that its in-store promotions were geared differently, Kodak simply claims that two competitors can stimulate demand better than one, even if the total amount and type of advertising is the same. Kodak claims that the "hype" created by its market entry expanded consumer desire for instant photography and could not have been duplicated by Polaroid.

Lastly, in Section (d), I examine the evidence offered

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by Kodak to show that its presence expanded the market. I consider both Professor Baumol's models and the other empirical evidence that Kodak offered to show market expansion.

(a) Kodak Sales Attributable to the Kodak Name and Kodak Features

*20 Kodak claims that many customers were drawn to instant photography because of the unique features it offered, namely, Kodak camera and film attributes, Kodak quality, and the Kodak name. While it may be true that some consumers preferred Kodak, this Court must determine whether these product features were critical and necessary to significant consumer interest in instant photography. Such a finding requires examination of the statements and actions of instant photography purchasers in the mid-1970s and early-1980s in order to see what motivated their purchases.

The overwhelming reason consumers purchased instant cameras during the infringement period was because of the instant feature. Study after study confirmed this. For example, a 1977 survey of 357 instant camera owners found that the top three reasons for getting an instant camera were the same whether one purchased Kodak or Polaroid: seventy-seven percent of Kodak purchasers said they chose the convenience of having pictures immediately; sixty-nine percent of Polaroid purchasers agreed. The other top two reasons--knowing almost immediately whether the picture turned out and the convenience of no processing--also stem from the instant feature. (PT 2454).

The reasons for purchasing instant cameras did not vary depending on which brand consumers ultimately chose. One 1981 Kodak study of about 1000 instant picture-takers was summarized by Kodak:

Picture-takers see instant as instant, not "Kodak-instant" and "Polaroid-instant." Thus, the fundamental attractions and barriers for acquiring and using a Kodak instant are no different from those for a Polaroid instant camera. Likewise, picture-takers' basic attitudes toward, perceptions of, and positioning of instant apply to the category as a whole and exhibit no meaningful brand-related differentiation.

(PT 2409). These studies, and other evidence consistent with their conclusions, have convinced me that, overall, Kodak did not offer the consumer something unique and critical to their decision to

purchase instant.

The Kodak Name. Professor Buzzell, Kodak's marketing expert, testified that Kodak's name and reputation drew many new customers to instant photography-- customers who would not have purchased an instant camera without a Kodak label. He testified that many amateur photographers were loyal to Kodak, many Kodak purchasers were anti-Polaroid and, most importantly, a large group viewed the Kodak name as a "reassurance or risk-reducing mechanism" which legitimized, and therefore made attractive, the instant photography field. (TR 8161). Professor Buzzell based this conclusion partly upon contemporaneous market research which tried to identify why consumers bought instant cameras.

There is no doubt that Kodak is a well-known brand and that the Eastman Kodak Company has a fine reputation. There is also no dispute that Polaroid is known the world over as a photographic company of first quality. Were the Kodak name and reputation somehow critical to consumers' decisions to purchase instant photography?

*21 To answer this question, Professor Buzzell cited several small, unstructured studies of Kodak and Polaroid instant purchasers which contained some statements that Polaroid and Kodak were perceived differently and that corporate image influenced the decision to buy instant. However, the record is devoid of any convincing evidence that the Kodak brand name was critical to a meaningful number of consumers who chose instant.

In one such study, Stage One, a marketing consulting group hired by Polaroid, conducted one-on-one in-depth interviews with two small samples of camera owners: thirty-two OneStep/Pronto! owners and twenty-two Kodak Instamatic owners in 1978, and twenty-nine Kodak Handle purchasers in 1979. At most, this study showed that some instant purchasers perceived Kodak and Polaroid differently. Some Kodak buyers thought that Kodak was more for the "man on the street" and Polaroid did not make cameras "for me." However, this type of random statement conflicted with other findings in the study; for example, both Kodak and Polaroid purchasers gave the same reasons for the appeal of instant photography. (DF 20,776).

Other studies mentioned by Professor Buzzell contained similar conflicts and no conclusive evidence. An October 1976 demonstration tested alternative versions of the Pronto!, EK4, and EK6,

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and concluded that when ranking the importance of various features in selecting a camera, reliability was rated number one, followed by value for money, simplicity of operation, and ease of use. Brand was considered the least important reason for choosing a particular camera, followed by appearance, weight, and size.

Professor Dolan, Polaroid's marketing expert, and Professor Buzzell's colleague at the Harvard Business School, also considered the question of whether Kodak's name and reputation were a major structural factor which influenced demand during the infringement period. While he admitted that for some loyal Kodak customers, Kodak's entry was the impetus for purchasing an instant camera, there were not meaningful numbers of these people. Like Professor Buzzell, Professor Dolan based his conclusions on market research. These conclusions, however, were buttressed with his analysis that the instant camera market did not need legitimizing by a well-known company because Polaroid was also well-known and trusted, especially in the field of instant photography. Moreover, Professor Dolan opined that legitimization is more likely when consumers themselves are unable to judge the quality of the product. This is not the case in the field of instant photography. I agree and adopt Professor Dolan's analysis as confirmation of the fact that the Kodak brand name did not expand demand for instant photography.

Even with its small sample and unstructured methodology, one finding which stands out from the Stage One study is that ninety-three percent of Kodak purchasers had negative impressions of Polaroid. These impressions were mostly based on antiquated notions about Polaroid photography from the pack era; some were derived from direct experience with a Polaroid camera and some from word-of-mouth and news reports. This finding deserves attention because it is consistent with other market research during the infringement period.

*22 I believe the record supports a finding that some anti-Polaroid animus existed in the marketplace due to largely outdated notions about instant photography. This was not an impenetrable barrier for some consumers, and sixty-seven percent of the Polaroid owners in the Stage One study had negative impressions of Polaroid. For the consumers who were permanently turned off, however, Kodak's entry was critical and represented market expansion. Nevertheless, it is impossible to quantify this effect. Professor Buzzell admitted that the results of the

Stage One study could not be applied to the general camera-purchasing public. (TR 8147-49). Keeping in mind that Polaroid is not required to prove that it could have made every sale and that any doubts in this matter must be resolved against Kodak, Lam, Inc., 718 F.2d at 1065, I cannot conclude that any anti-Polaroid animus that existed would have diminished demand in the absence of Kodak's infringement. The same reasoning applies to those sales made to the small number of loyal Kodak-only customers, such as certain Kodak employees. I am sure these customers existed but I do not believe their numbers are significant, and, in any event, no reliable evidence was offered to prove those numbers.

Kodak Product Features. Kodak alleges that certain features of its instant photography system expanded the demand for instant products as a category. Polaroid has claimed that the law assumes that demand is due only to the patented invention, but I have previously found that many other factors may influence demand in this market. Here, Kodak claims that physical attributes of its products, along with the patented technology, expanded demand. Kodak also claims product variety in and of itself, expanded consumer interest in the whole product line. As usual, the answer lies in the facts and not in assumptions. I find that one Kodak attribute so transformed the product for certain purchasers that it did expand demand in one market segment. I also find, as I did above when considering the Kodak brand name, that the weight of the evidence shows that it was the instant feature, not Kodak extras, that caused the greatest demand for instant products.

The features that Kodak believes most influenced demand were the shape and finish of Kodak prints, Kodak quality color, and the built-in flash. Kodak also presented evidence on the handle feature and finishes on certain camera models, but the effect of those features on sales was negligible.

In April 1980, Polaroid commissioned a study of picture alternatives which asked 600 interviewees to choose between two prints and give the reasons for their choice. This study concluded that, "[In] a direct comparison of the current square SX-70 and Kodak's rectangular PR-10 show that the majority of consumers prefer the rectangle." (DF 21,180). The 1974 National Analyst Study found that sixty-nine percent of consumers preferred the matte finish of the Kodak print as opposed to the glossy Polaroid surface. (PT 2458). Neither of these facts compel a conclusion that the Kodak print features influenced demand.